What is claimed is:

1. An isolated non-mouse mammalian pluripotential embryonic stem cell which can:

(a) be maintained on feeder layers for at least 20 passages; and

(b) give rise to embryoid bodies and multiple differentiated cell phenotypes in monolayer culture.

2. The embryonic stem cell of claim 1, having a mutation which renders a gene non-functional.

3. The embryonic stem cell of claim 1, having an insertion of a functional gene.

4. An isolated human pluripotential embryonic stem cell which can:

(a) be maintained on feeder layers for at least 20 passages; and

(b) give rise to embryoid bodies and multiple differentiated cell phenotypes in monolayer culture.

5. A composition comprising:

(a) mammalian pluripotential embryonic stem cells; and

(b) a fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, and soluble steel factor in amounts to enhance the growth and allow the continued proliferation of the cell.

6. The method of claim 5, wherein the fibroblast growth factor is basic fibroblast growth factor.

7. A composition comprising:

(a) human pluripotential embryonic stem cells; and

(b) a fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, and soluble steel factor in amounts to enhance the growth and allow the continued proliferation of the cell.

8. A composition comprising:

(a) mammalian primordial germ cells; and

(b) a fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor and soluble steel factor in amounts to enhance the growth and allow the continued proliferation of the cells and the formation of pluripotent embryonic stem cells from the primordial germ cell.

9. The composition of claim 8, wherein the fibroblast growth factor is basic fibroblast growth factor.

10. A composition comprising:

(a) embryonic ectoderm cells; and

(b) fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor and soluble steel factor in amounts to enhance the growth and allow the continued proliferation of the cells and the formation of pluripotent embryonic stem cells from the embryonic ectoderm cells.

11. A composition comprising:

(a) germ cells; and

(b) fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor and soluble steel factor in amounts to enhance the growth and allow the continued proliferation of the cells and the formation of pluripotent embryonic stem cells from the germ cells.

12. The composition of claim 11, wherein the fibroblast growth factor is basic fibroblast growth factor.

13. A composition comprising a fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, and soluble steel factor in amounts to enhance the growth and allow the continued proliferation of primordial germ cells and the formation of pluripotent embryonic stem cells from the primordial germ cells.

14. The composition of claim 13, wherein the fibroblast growth factor is basic fibroblast growth factor.

15. A method of making a mammalian pluripotential embryonic stem cell comprising culturing a primordial germ cell in a composition comprising a growth enhancing amount of basic fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, and soluble steel factor, thereby making a pluripotential embryonic stem cell from the primordial germ cell.

16. The method of claim 15 wherein the primordial germ cell is derived from a human.

17. The method of claim 15, wherein the primordial germ cell is derived from a mouse.

18. A pluripotential embryonic stem cell produced by the method of claim 15.

19. A human pluripotential embryonic stem cell produced by the method of claim 16.

20. A method of making a mammalian pluripotential embryonic stem cell comprising culturing an embryonic ectoderm cell in a composition comprising a growth enhancing amount of basic fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, and soluble steel factor, thereby making a pluripotential embryonic stem cell from an embryonic ectoderm cell.

21. The method of claim 20, wherein the embryonic ectoderm cell is derived from a human.

22. The method of claim 20, wherein the embryonic ectoderm cell is derived from a mouse.

23. A pluripotential embryonic stem cell produced by the method of claim 20.

24. A human pluripotential embryonic stem cell produced by the method of claim 21.

25. A method of making a mammalian pluripotential embryonic stem cell comprising culturing a germ cell in a composition comprising a growth enhancing amount of basic fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, and soluble steel factor, thereby making a pluripotential embryonic stem cell from a germ cell.

26. The method of claim 25, wherein the germ cell is derived from a human.

27. A pluripotential embryonic stem cell produced by the method of claim 25.

28. A pluripotential embryonic stem cell produced by the method of claim 26.

29. A method of screening for a cell which can be promoted to become a pluripotential embryonic stem cell comprising culturing the cell in a composition comprising basic fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, and soluble steel factor in amounts to enhance the growth and allow the formation of pluripotential embryonic stem cells, and determining which cells become embryonic stem cells.

30. A method of using a non-human pluripotential embryonic stem cell of claim 1 to contribute to chimeras in vivo comprising injecting the cell into a blastocyst and growing the blastocyst in a foster mother.

31. A method of using a non-human embryonic stem cell of claim 1 to contribute to chimeras in vivo, comprising aggregating the cell with a morula stage embryo and growing the embryo in a foster mother.

32. A method of screening factors for the ability to promote the formation of pluripotential embryonic stem cells, comprising culturing primordial germ cells or embryonic ectoderm cells in a feeder layer comprising a fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, soluble steel factor and the growth factor to be screened, and determining the formation of pluripotential embryonic stem cells.

33. A method of obtaining a cell for therapy comprising deriving a cell from the pluripotential embryonic stem cell of claim 1 and determining whether the derivative cell can be utilized for therapy.

34. A method of obtaining a cell for therapy comprising deriving a cell from the pluripotential embryonic stem cell of claim 4 and determining whether the derivative cell can be utilized for therapy.

35. A method of screening a factor for the ability to derive a cell from the pluripotential embryonic stem cell comprising adding the factor to the pluripotential embryonic stem cell of claim 1 and determining whether a derivative cell is formed.

36. A method of screening a factor for the ability to derive a cell from the pluripotential embryonic stem cell comprising adding the factor to the pluripotential embryonic stem cell of claim 4 and determining whether a derivative cell is formed.